PRELIMINARY ANALYSIS AND FINDINGS REQUIRED BY HEALTH AND SAFETY CODE SECTION 25150.6
DTSC RULEMAKING R-02-04
MERCURY WASTE CLASSIFICATION AND MANAGEMENT REGULATIONS
JULY 30, 2002

INTRODUCTION

Rulemaking R-02-04, referred to as the proposed mercury waste classification and management regulations, would permit handlers of a list of ten categories of discarded mercury-containing products to manage these wastes in a manner that differs from statutory requirements for hazardous waste. This rulemaking would add discarded mercury-containing products to the list of wastes that can be managed under the existing State universal waste regulations contained in California Code of Regulations, title 22, division 4.5, chapter 23. The universal waste regulations provide alternate management standards for certain hazardous wastes or categories of wastes that are generated by a large portion of the general public. This document sets forth the preliminary analysis and findings required by Health and Safety Code section 25150.6 for regulations that vary from statutory requirements for hazardous wastes.

The Department of Toxic Substances Control (DTSC) will accept comments on this document during the 45-day public comment period for the draft mercury waste classification and management regulations. This document will be updated to address any necessary changes, any comments received, and to conform with any changes made to the regulations after the public notice period(s). The updated document will be made available during the same comment periods established for post-hearing changes to the regulations. The final document will be made available upon request and will be posted on DTSC's Internet site at least 10 days prior to formal adoption of the regulations and transmittal to the Office of Administrative Law for final review.

THE PROPOSED MERCURY WASTE CLASSIFICATION AND MANAGEMENT REGULATIONS

The proposed regulations would do two things. First, they would “list”, four mercury-containing products as hazardous waste when discarded. Second, they would allow management of specific mercury-containing hazardous wastes as universal wastes under the Universal Waste Rule, found in the California Code of Regulations, title 22, division 4.5, chapter 23. The hazardous waste listing element of these regulations does not exempt the affected wastes from any hazardous waste management requirement and therefore, it is not addressed in this analysis.

The waste management element of these proposed regulations would establish standards for discarded mercury-containing products. These discarded products are identified in

the proposed regulations as "universal wastes." Universal wastes are managed pursuant to the State's Universal Waste Rule, adopted in chapter 23 of the California Code of Regulations, title 22. The State's existing universal waste regulations are based on the U.S. Environmental Protection Agency's (U.S. EPA's) Universal Waste Rule.

Both the existing and proposed universal wastes are produced by large segments of society, whereas most other hazardous wastes are produced by industrial generators. Given the wide generation of relatively small volumes of universal wastes, the full hazardous waste requirements developed for large, industrial hazardous waste generators are not optimal for generators of these wastes. However, while the handling of discarded mercury-containing products poses lower risks than most other hazardous wastes, proper management and ultimate disposition of these wastes are essential, because of mercury's toxicity and behavior in the environment. The large cumulative volumes of these wastes present a significant threat to the state's environment if they are not properly managed. For these reasons, DTSC has determined that the management of waste mercury-containing products is appropriate under the universal waste regulations. For further information about the contents, scope, and standards of the proposed Mercury Waste Classification and Management regulations, please see the 45 day Public Notice and the Initial Statement of Reasons for Rulemaking R-02-04.

Conditional Exemptions

This rulemaking would allow households to manage their universal waste, in some respects, as non-hazardous waste. To be eligible for the exemption, the person who generates a mercury-containing universal waste would be prohibited from treating or disposing of the waste, and would be allowed to take or send it only to a universal waste handler or destination facility (i.e., a permitted hazardous waste facility).

Management Standards

The mercury waste classification and management regulations establish special standards that are specific to the particular type of waste being managed. These standards allow simple and cost-effective management of each new universal waste, while incorporating those requirements necessary to protect the handlers and transporters of the waste, as well as public health and the environment. Most of the mercury-containing wastes added in these regulations must ultimately be recycled to be eligible for universal waste management. Those wastes for which DTSC has determined recycling is not feasible must ultimately be sent for disposal at a permitted hazardous waste landfill. The proposed regulations establish specific standards for discarded mercury-containing products that deviate from the following hazardous waste standards in statutes:

1. Storage time limits at transfer facilities (Health and Safety Code section 25123.3).

This section defines a "storage facility." A transfer facility where hazardous waste is held in the course of transportation for less than 10 days in areas zoned industrial and less than six days in all other areas is not a storage facility.

2. Use of the manifest for transportation (Health and Safety Code section 25160). This section requires the use of a Uniform Hazardous Waste Manifest (manifest) for transporting hazardous wastes and establishes procedures for the use of the manifest.

3. Use of a registered hazardous waste transporter (Health and Safety Code section 25163). This section requires all hazardous waste to be transported by a registered hazardous waste transporter and establishes requirements for registered transporters.

4. Hazardous waste facilities permit requirement for offsite intermediate accumulation points (Health and Safety Code section 25201). This section requires a hazardous waste facilities permit or other grant of authorization for offsite storage of hazardous waste. (Health and Safety Code section 25201 establishes the permit requirement for a storage facility; Health and Safety Code section 25123.3 defines a storage facility as a facility which accepts hazardous waste from offsite sources.)

ORGANIZATION OF THIS DOCUMENT

This document follows the organization of Health and Safety Code section 25150.6. To assist the reader's understanding of the analysis and findings, each subdivision of Health and Safety Code section 25150.6 is shown in *italics* prior to the "DTSC Evaluation" headings. The "DTSC Evaluation" for each subdivision includes the analysis, explanation, and/or other information necessary to support the conclusion that this proposed rulemaking accomplished the statutory goals of section 25150.6 . Each subdivision of the statute is addressed in this document and, where applicable, the "DTSC Evaluation" identifies those subdivisions that are not applicable to this proposed rulemaking.

INCORPORATION BY REFERENCE

This proposed State rulemaking for the inclusion of waste mercury-containing products into the existing State universal waste regulations is based largely on the corresponding federal Universal Waste Rule. DTSC used similar rationale behind the federal rule to develop the proposed regulations. Any facts and figures used to develop the proposed regulations are specific to California. The four federal register notices that established the

federal Universal Waste Rule are incorporated by reference into this document:

58 F.R. 8102 (February 11, 1993): Proposed Universal Waste Rule

59 F.R. 38288 (July 27, 1994): Proposed Lamps Rule

60 F.R. 25492 (May 11, 1995): Final Universal Waste Rule

64 F.R. 36466 (July 6, 1999): Final Rule - Hazardous Waste Lamps

FORMAL SECTION 25150.6 ANALYSIS

As discussed above, DTSC proposes to exempt waste mercury-containing products from four separate statutory sections: Health and Safety Code sections 25123.3, 25160, 25163, and 25201. The required analysis follows.

> *Section 25150.6. (a) Except as provided in subdivision (e) and (f), the department, by regulation, may exempt a hazardous waste management activity from one or more of the requirements of this chapter, if the department does all of the following:*
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> *(1) Prepares an analysis of the hazardous waste management activity to which the exemption will apply pursuant to subdivision (b). The department shall first prepare the analysis as a preliminary analysis and make it available to the public at the same time that the department gives notice, pursuant to Section 11346.4 of the Government Code, that it proposes to adopt a regulation exempting the hazardous waste management activity from one or more of the requirements of this chapter. The department shall include, in the notice, a reference that the department has prepared a preliminary analysis and a statement concerning where a copy of the preliminary analysis can be obtained. The information in the preliminary analysis shall be updated and the department shall make the analysis available to the public as a final analysis not less than ten working days prior to the date that the regulation is adopted.*

DTSC Evaluation: The preliminary analysis will be made available on the DTSC Internet site. The analysis is referenced, as required, in both the 45-day Public Notice and the Initial Statement of Reasons. The analysis is made available for public review and comment simultaneously with the proposed regulations, and the Initial Statement of

Reasons. This document provides the preliminary analysis and findings pursuant to Health and Safety Code section 25150.6.

(2) Demonstrates that one of the conclusions required by subdivision (c) is valid.

DTSC Evaluation: This document demonstrates that the applicable conclusions found in paragraphs (3) and (4) of subdivision (c) are valid. See the discussions following text of those paragraphs for the preliminary analysis.

(3) Imposes, as may be necessary, conditions and limitations on the exemption that ensure that the exempted activity will not pose a significant potential hazard to human health or safety or to the environment.

DTSC Evaluation: The conditions imposed, along with the requirements established by federal, state, and local jurisdictions (including requirements for management of hazardous materials, business operations, and worker safety), to ensure the exemptions will not pose a significant potential hazard to human health, safety or the environment are the universal waste management standards being adopted, in part, under the authority of Health and Safety Code section 25150.6. That is, the project itself incorporates the conditions necessary to protect human health, safety, and the environment. The particular provisions are discussed in detail later in this document.

Section 25150.6 (b) Before the department gives notice of a proposal to adopt a regulation exempting a hazardous waste activity from one or more of the requirements of this chapter pursuant to subdivision (a), and before the department adopts the regulation, the department shall evaluate the hazardous waste management activity and prepare, as required by paragraph (1) of subdivision (a), an analysis that addresses all of the following aspects of the activity, to the extent that the requirement or requirements from which the activity will be exempted can affect these aspects of the activity:

DTSC Evaluation: This document provides the evaluation and analysis. Specific portions follow after the text of each of the statutory subdivisions quoted below.

(1) The types of hazardous waste streams and the estimated amounts of hazardous waste that are managed as part of the activity and the hazards to human health or safety or to the environment posed by reasonably foreseeable mismanagement of those hazardous wastes and their hazardous constituents. The estimate of the amounts of hazardous waste that are managed as part of the

activity shall be based upon information reasonably available to the department.

DTSC Evaluation: The specific waste streams, estimated amounts, and the hazards of their mismanagement are discussed below. Following the discussion of each of the waste streams is an additional detailed description of the hazards of mercury, which is found in all of the hazardous wastes that are being designated as universal wastes.

A. Mercury Switches and Thermometers. Includes:

- Mercury-containing motor vehicle switches, and vehicles that contain them (M001 Wastes)
- Non-automotive mercury switches and products that contain them (M002 Wastes)

Mercury switches are used in vehicles in a variety of applications, including convenience lighting, antilock brake systems (ABS), ride stabilizers, and alarms. They are used in some non-vehicle products as well, including tilt switches in certain large household appliances. Mercury switches take advantage of two of mercury's useful properties: its conduction of electricity and its liquid state at room temperature. They typically consist of a capsule (often composed of glass) that contains two metallic contacts and a ball of mercury. If the switch is tilted, the mercury completes the circuit between the two contacts, allowing electric current to flow. Mercury switches are found in a wide range of vehicles manufactured from the mid-1980s until very recently. They also occur in certain older household appliances and in some shoes equipped with flashing lights. The mercury contained in these switches is released when an appliance or vehicle is baled, sheared, crushed, or shredded for recycling. Some of the mercury is emitted directly to air, while some remains associated with the non-metallic fluff that is generated during shredding. Auto shredder fluff is often used as daily cover in non-hazardous Class 3 landfills in California.

DTSC estimates that between 0.75 and 1.5 tons of mercury are contained in the vehicles scrapped annually in California. Little of this mercury is currently recycled or disposed as hazardous waste. A similar amount of mercury may reside in the household appliances recycled annually in California. DTSC does not have data on the number of mercury switches in shoes with flashing lights, but believes it to be small relative to the number in discarded vehicles and appliances.

In current practice, mercury switches are not commonly removed from vehicles and products prior to recycling or disposing them. It should be noted that, because vehicles and some appliances that contain mercury switches are not currently classified as

hazardous wastes, recycling or disposing them as nonhazardous wastes do not, technically, constitute "mismanagement." Those switches that are removed are subject to full regulation as hazardous waste.

To encourage the recycling of mercury-containing switches, mercury waste classification and management regulations will streamline the requirements for managing removed mercury switches, provided they are recycled to recover their mercury. The proposed streamlined standards for persons who handle and transport removed mercury switches will provide these persons with an administrative incentive and the means to manage them without compromising public health and environmental safety. The risks associated with mismanagement of mercury switches are the same as those posed by other wastes that contain mercury. The environmental and health risks of mercury are discussed separately, later in this document.

- Mercury thermometers

Mercury thermometers take advantage of another of mercury's useful properties: its uniform rate of expansion with increasing temperature. The height of a column of liquid mercury in a sealed glass tube is correlated with the temperature being read. Many households in the State have one or more mercury fever thermometers, as do some hospitals and clinics (although voluntary efforts are underway, in California and nationally, to replace mercury fever thermometers in health care facilities with mercury-free substitutes). Mercury thermometers are also commonly used in laboratories. While DTSC does not have data on the precise number of mercury thermometers in use in California, an estimate of ten million or more may not be unreasonable, given the State's population of 33.8 million persons. Unlike that of vehicles and appliances, the performance of a thermometer does not deteriorate over time, and absent voluntary efforts to eliminate them from health care facilities, they generally would be expected to remain in use until they break. Assuming that ten million mercury thermometers are in use in the State, and that ten percent of these thermometers in use break during any given year, each containing one gram of mercury, approximately one ton of mercury would be released annually. In another calculation based on a U.S. EPA projection for the U.S. as a whole, DTSC estimated that two tons of mercury in thermometers would have been disposed in California' municipal landfills in 2000.

As mentioned above, mercury thermometers are most commonly discarded when they break. DTSC believes the improper disposal of intact and broken mercury thermometers by households is common, and results in the preventable release of a significant amount of mercury. DTSC believes that by streamlining the management requirements, recycling and proper management of thermometers will be accomplished rather than improper

disposal and without compromising public health and environmental safety. The risks of the mismanaging mercury-containing wastes are discussed later in this analysis.

B. Dental Amalgam Wastes.

Dental amalgam is composed of approximately 50 percent mercury. Its mercury concentration, therefore, greatly exceeds the hazardous waste regulatory thresholds and it is normally classified as hazardous waste. Amalgam fines, sludges, single-use traps, etc., are currently fully regulated hazardous wastes. Under the proposal, all amalgam wastes could be managed as universal wastes.

Amalgam waste is generated by nearly all of California's dentists, by each in relatively small quantities. DTSC does not have precise data on the volumes of these waste streams. While larger particles of waste amalgam are often recycled by dentists (and are exempt from hazardous waste regulation if they are recycled), smaller amalgam fines have typically been washed down drains. As more dentists in California equip their offices with chairside traps and filters to capture tiny amalgam particles, the proposed mercury waste classification and management regulations will provide streamlined standards for handling and transporting them prior to recycling.

Reasonably foreseeable mismanagement practices for amalgam waste would include rinsing it down drains, discarding it in the nonhazardous trash, and discarding it in medical waste containers destined for incineration (during which the mercury may be released to the atmosphere).

C. Pressure or Vacuum Gauges.

This proposed new category of universal waste includes a variety of devices used to measure pressure. They include barometers, manometers, and sphygmomanometers (blood pressure gauges). By their principle, the mercury in a vacuum or pressure gauge cannot be entirely encapsulated. In order to work, the surface of the mercury must be directly exposed to the gas whose pressure is being measured. Like mercury thermometers, these devices would not usually be expected to be discarded unless broken. Also like some mercury thermometers, some gauges (specifically sphygmomanometers) are the subject of ongoing efforts at health care facilities to replace them with mercury-free substitutes. Because vacuum and pressure gauges are not consumable products that are routinely disposed, DTSC does not have precise data on the number of mercury-containing vacuum or pressure gauges generated in the State. As with thermometers, they are most commonly generated by laboratories and health care facilities.

Pressure or vacuum gauges, which are commonly composed of a glass tube containing mercury, could be mismanaged in ways that could result in the release of mercury to the environment. One possibility is that intact gauges might be discarded in the nonhazardous trash (although DTSC does not have reason to believe that this practice is widespread). In a more likely scenario, a gauge may break and be improperly cleaned up. Spilled mercury broken pieces, and cleanup residues could be placed in the non hazardous trash or rinsed or poured into a drain.

D. Mercury-Added Novelties.

Public Resources Code section 15027 defines a mercury-added novelty as "a mercury-added product intended mainly for personal or household enjoyment or adornment. A 'mercury-added novelty' includes, but is not limited to, any item intended for use as a practical joke, figurine, adornment, toy, game, card, ornament, yard statue or figure, candle, jewelry, holiday decoration, and item of apparel, including footwear." As can be seen from the definition, mercury added-novelties would be expected to be generated primarily by households (although wholesalers and retailers might discard some). Many mercury-added novelties are hazardous wastes in California, due to their mercury concentration. The proposed regulations will designate all currently nonhazardous mercury-added novelties as hazardous wastes in California, effective in 2004. Because many novelties are not routinely discarded, DTSC cannot estimate precisely the number generated in the State. It would not be unreasonable, however, to assume that many, if not most, of California's 12 million households has at least one product meeting the definition of a mercury-added novelty that will one day be discarded.

DTSC believes that that discarded mercury-added novelties that are currently hazardous waste are widely mismanaged by being disposed in the nonhazardous waste stream. Households may be unaware that these discarded products are hazardous wastes, and may not know how to properly manage them.

E. Mercury Counterweights and Dampers.

This new universal waste category includes products that take advantage of mercury's high density. These products include counterweights used in some old clocks, bow stabilizers used in archery, and recoil suppressors for shotguns. These products are used primarily by households and, like many of the other products covered by these regulations, they are items that would not be expected to be discarded frequently. Consequently, DTSC is not able to estimate the number of mercury counterweights and dampers discarded in the State. For those that are wastes, the most common and likely

mismanagement practice is the same as for other hazardous wastes generated by households: disposal in the nonhazardous waste stream.

F. Mercury Dilators.

Several types of gastrointestinal and esophageal dilators, some of which use mercury for weight, are used in certain medical procedures. Dilators are widely used in hospitals and clinics, statewide. Each may contain 100 grams, or more, of liquid mercury. Dilators are reused again and again, and are not normally considered consumable products that are frequently discarded. However, like fever thermometers and sphygmomanometers, mercury-containing dilators have been the subject of voluntary efforts to eliminate the use of mercury in health care facilities. Many of the State's hospitals and clinics may already have replaced their mercury dilators with non-mercury substitutes. DTSC does not have data on the number of dilators discarded in California. Waste mercury dilators could potentially be mismanaged by being disposed in the nonhazardous trash, or in medical waste bags destined for incineration (where mercury might be released to the environment). However, DTSC does not have reason to believe that these are widespread practices.

G. Mercury-Containing Rubber Flooring.

At least one brand of rubber flooring used in gymnasiums in the 1970s was formulated to include mercury. DTSC believes that the manufacture of this material ceased in the 1970s, but it may continue to be replaced or disposed from time to time. Schools, colleges, and universities would be expected to be the most common generators of this type of flooring. DTSC does not know how widely mercury-containing rubber flooring was used in California, nor whether most or all of the material has already been removed. Due to this uncertainty, and the infrequent disposal of flooring materials in general, DTSC cannot estimate the amount of this flooring that is generated in the State.

The most likely mismanagement scenario for this flooring material is disposal in a nonhazardous waste landfill. DTSC does not have any information to indicate that such disposal is widespread.

H. Mercury Gas Flow Regulators.

Some older residential gas meters (installed prior to 1961) contain mercury gas flow regulators, each of which can contain 100 grams of mercury. The handlers of these meters are, in almost all cases, gas company employees or their contractors. DTSC does not know how many such regulators were installed in California, nor whether most

have been replaced with newer, mercury-free meters. Consequently, DTSC cannot estimate the number of such regulators discarded annually in California. Mismanagement scenarios for this waste stream include spilling of mercury during the replacement of a gas meter and improper disposal of a regulator, or a meter that contains one, as nonhazardous waste.

I. Hazards of Mercury.

Mercury can occur in a variety of forms, all of which are toxic. Mercury is poisonous to the central nervous system, and the kidneys, and is a potent developmental neurotoxin. The most infamous outbreak of mercury poisoning was first identified in 1956, among residents of the Minamata Bay region on the island of Kyushu, Japan. These people were highly exposed to methlymercury from ongoing, heavy consumption of fish, which were contaminated with mercury from industrial pollution. According to one author, 59 percent of exposed persons exhibited mental or neurological disorders.

Elemental mercury, which is found in most of the products designated as universal wastes in this rulemaking, is toxic to humans and may be absorbed into the body when a person inhales its vapors. The biggest environmental and public health concern with elemental mercury, however, is its the release into the environment. Mercury can easily move between land, air and water. Once in water, aquatic bacteria can convert it to the methylmercury form, which is considered the more toxic form of mercury. Once converted, methlymecury is taken up by other aquatic organisms and up the food chain. Predator fish species can have much higher methylmercury levels in their tissues than is seen in the water or the prey species upon which they feed. Humans who consume predator fish species caught in contaminated waters may ingest unsafe levels of methylmercury and may suffer ill effects. Pregnant women and nursing mothers who consume contaminated fish can pass on methylmercury to their babies.

While the proposed regulations address management of elemental mercury, the form of mercury most toxic to biological resources is methylmercury. The proposed regulations are designed to prevent releases of elemental mercury to air, soil, or water, which may indirectly impact elemental mercury conversion to methylmercury and its entrance into the biological food chain.

> *(2) The complexity of the activity, and the amount and complexity of operator training, equipment installation and maintenance, and monitoring that are required to ensure that the activity is conducted in a manner that safely and effectively manages the particular hazardous waste stream.*

DTSC Evaluation: Following is an evaluation and analysis of the management of universal waste in general, followed by detailed analyses for discarded mercury-containing products addressed in the proposed regulations.

A. Management of Universal Waste in General

Effective management of universal wastes, including discarded mercury-containing products, is neither difficult nor complex. Additionally, it requires minimal training and the training is straightforward and inexpensive. The proposed rules require that employees be made aware that these wastes are regulated as universal wastes and may not be indiscriminately disposed. Training must cover the specific requirements for properly managing each waste type. Beyond training on physical handling, packaging, and storage requirements, training must address administrative concerns such as proper labeling and accumulation time limits. Further, persons who remove mercury switches from waste vehicles and appliances, or handlers (limited to generators) who drain liquid mercury from pressure or vacuum gauges, must be trained in safe procedures for the activity in question, and in how to respond to spills.

B. Management of Universal Waste Mercury Switches and Thermometers

The mercury waste classification and management regulations' requirements for handlers of removed switches and thermometers are straightforward. As long as mercury switches and thermometers remain intact, they are intrinsically safe. Mercury can escape from switches or thermometers that are broken; they must, therefore, be sealed in an airtight container. Handlers who remove switches from vehicles and products are subject to more extensive requirements for training, air monitoring, record keeping, etc. These additional requirements are not especially complex, and should not require additional tools or equipment beyond that which is ordinarily used by persons who recycle vehicles and other products that may contain mercury switches. The requirements include:

- Having a mercury clean-up system available;
- Transferring any spilled mercury to an airtight container;
- Removing switches in a well ventilated area that is monitored for compliance with occupational exposure limits for mercury; and
- Formally training employees who remove mercury switches in proper waste handling and emergency procedures.

C. Management of Universal Waste Dental Amalgam

The specific standards for managing dental amalgam waste are straightforward:

Amalgam must be placed in airtight containers. In order to prevent the release of amalgam waste to the environment, handlers are prohibited from rinsing amalgam traps into a sink, and they may not place amalgam waste into a medical waste container. No special training or equipment should be necessary to comply with these requirements.

D. Management of Universal Waste Vacuum and Pressure Gauges

As with the other universal wastes added by this proposal, the management of universal waste vacuum or pressure gauges generally should not require special equipment or training. The additional requirements imposed for onsite handlers (limited to generators), who drain the mercury from gauges are somewhat more complex, however. These onsite handlers must:

- Develop and follow written procedures for safely draining mercury,
- Drain gauges over a containment device,
- Keep a mercury spill clean-up kit on hand,
- Transfer drained mercury to an appropriate container,
- Drain mercury in a well-ventilated area and monitor the area for compliance with OSHA mercury exposure levels, and
- Train employees in draining procedures, waste handling, and emergency procedures,
- Store drained elemental mercury in an appropriate container, which is placed in a compatible secondary container,
- Keep records of the gauges drained, and
- Not accumulate more than 35 kilograms of drained mercury at any time.

E. Management of Universal Waste Mercury-Added Novelties.

The management of waste novelties requires no special equipment, training or monitoring on the part of universal waste handlers or transporters. Novelties whose mercury is contained in a battery or batteries are subject to the existing universal waste battery standards; those that contain mercury only in a mercury switch are subject to the proposed standards for switches. Handlers of novelties that contain free liquid mercury must pack them in airtight containers with packing materials that are adequate to prevent breakage.

F. Management of Universal Waste Mercury Counterweights and Dampers.

Management of universal waste mercury counterweights and dampers requires no special equipment, training or monitoring on the part of universal waste handlers or transporters beyond the general universal waste handler and transporter standards.

G. Management of Universal Waste Mercury Dilators.

Management of universal waste mercury dilators requires no special equipment, training or monitoring on the part of universal waste handlers or transporters beyond the general universal waste handler and transporter standards.

H. Management of Universal Waste Mercury-Containing Rubber Flooring.

Management of universal waste mercury-containing rubber flooring requires no special equipment, training or monitoring on the part of universal waste handlers or transporters beyond the general universal waste handler and transporter standards.

I. Management of Universal Waste Mercury Gas Flow Regulators.

Management of universal waste mercury gas flow regulators requires no special equipment, training or monitoring on the part of universal waste handlers or transporters beyond the general universal waste handler and transporter standards

> *(3) The chemical or physical hazards that are associated with the activity and the degree to which those hazards are similar to, or differ from, the chemical or physical hazards that are associated with the production processes that are carried out in the facilities that produce the hazardous waste that is managed as part of the activity.*

DTSC Evaluation: The universal waste management standards proposed for all of the new mercury-containing universal wastes require management of the waste "in a way that prevents releases of any universal waste or component of a universal waste to the environment." Universal waste management (i.e., handling, storage, transportation) of waste mercury-containing products generally has fewer chemical or physical hazards than the manner (activities) in which the waste was generated.

As discussed earlier, some waste mercury-containing products are most commonly generated when they break and can no longer be used. Breakage of mercury-containing products in which mercury is present in its liquid form, whether accidental or intentional, is associated with more and greater hazards than is careful management of these products to prevent breakage during their use. These proposed universal waste management standards do the same; that is, the handling, storage, and transportation universal waste management standards are designed to prevent breakage and contain any potential releases if spilled or broken during these activities. Consequently, the universal waste management activities will generally have fewer hazards associated with them than when

the waste is generated (breakage during use).

Pressure and vacuum gauges and thermometers are two categories of products that pose greater risks to human health and the environment when broken. When they break, gauges and thermometers release mercury. Released mercury can directly endanger human health and can also enter the aquatic environment, where it can be converted to methylmercury, and then enter the food chain. Similarly, the crushing, baling, shearing, or shredding of vehicles and appliances without first removing all mercury switches leads to the release of mercury to air and land, and potentially, to the exposure of workers to unsafe levels of mercury vapors. The proposal would require careful management of discarded products to prevent mercury releases, and would also require the removal of all mercury switches from vehicles prior to processing them by crushing, baling, shearing, or shredding.

The proposal allows the onsite draining of mercury from discarded mercury pressure and vacuum gauges by handlers who generate the waste. Many mercury gauges are fragile and can easily break, releasing mercury. They also have openings through which mercury can escape. The draining of mercury from these discarded products under the controlled conditions required by these regulations poses fewer hazards than the uncontrolled release of mercury that can potentially occur when these items break, leak, or spill. Additionally, draining of mercury is a common practice when the items are in use as part of routine maintenance (draining "old" mercury and replacing with "fresh" mercury), and therefore poses no extra risk when done onsite by the handler (generator) prior to transport to a recycling facility.

> *(4) The types of accidents that might reasonably be foreseen to occur during the management of particular types of hazardous waste streams as part of the activity, the likely consequences of those accidents, and the actual reasonably available accident history associated with the activity.*

DTSC Evaluation: The most common types of accidents during the management of discarded mercury-containing products as universal wastes will likely be breakage of, or spillage of mercury from, these products. Handlers of these wastes are required by the proposed regulations to train employees in appropriate emergency response procedures and to have mercury spill cleanup kits on hand. The regulations also require universal waste handlers to promptly clean up spilled mercury. These and other safeguards should prevent uncontrolled releases of mercury the environment. The relatively small amounts of spilled mercury would be confined to the immediate area where a spill occurred and would be promptly cleaned up. Any accumulated mercury from onsite drainage is limited to 35 kilograms; therefore, any potential spills from drained mercury is not only limited to 35

kilograms, but also is mitigated by secondary containment storage requirements.

Vehicle accidents may occasionally occur during the transportation of waste mercury-containing products. Universal waste management standards will mitigate the consequences of such accidents. All of the waste specific standards for discarded products that contain liquid mercury require that the products be sealed in a non-leaking container. For fragile products, handlers are required to add packing material to the container sufficient to prevent breakage. Also, the general universal waste transporter standards require transporters to "immediately contain all releases of universal wastes and other residues from universal wastes."

> *(5) The types of locations at which the activity may be carried out, an estimate of the number of these locations, and the types of hazards that may be posed by proximity to the land uses described in subdivision (b) of Section 25232. The estimate of the number of locations at which the activity may be carried out shall be based upon information reasonably available to the department.*

DTSC Evaluation: DTSC estimates that at least one million businesses in California generate universal wastes. Universal waste, including some categories of discarded mercury-containing products, are found in most of these businesses and in the 12 million households in the State. However, some of the universal wastes added by the proposed mercury waste classification and management regulations will likely be handled at certain specific types of locations (in most cases, DTSC lacks data on the specific number of each of type of facility listed below that would handle the proposed new universal wastes):

- Handling and removal of mercury-containing motor vehicle switches will take place largely at auto dismantling facilities; DTSC believes there are over 1400 such facilities in California.
- Handling of non-automotive mercury switches found in large appliances will take place at landfills that divert appliances from disposal, and at recycling facilities;
- Handling of dental amalgam wastes will occur at virtually all of the State's dental offices;
- Handling of vacuum and pressure gauges will occur at health care facilities and laboratories;
- Handling of some fever thermometers, most blood-pressure gauges, and virtually all mercury dilators will occur at health care facilities;
- Handling of mercury-added novelties, and mercury counterweights and dampers, will occur largely in households;
- Handling of mercury-containing rubber flooring will occur primarily at gymnasiums; and
- Handling of mercury gas flow regulators will take place in various locations, but the

handlers of these devices will be, almost exclusively, gas company personnel.

FINDINGS

Section 25150.6 (c): The department shall not give notice proposing the adoption of, and the department may not adopt, a regulation pursuant to subdivision (a) unless it first demonstrates, using the information developed in the analysis prepared pursuant to subdivision (b), that one of the following is valid:

(1) The requirement from which the activity is exempted is not significant or important in either of the following:

(A) Preventing or mitigating potential hazards to human health or safety or to the environment posed by the activity.

DTSC Evaluation: The finding above is not applicable to the exemption from certain hazardous waste management requirements provided in the proposed mercury waste classification and management regulations.

(B) Ensuring that the activity is conducted in compliance with other applicable requirements of this chapter and the regulations adopted pursuant to this chapter.

DTSC Evaluation: The finding above is not applicable to the exemption from certain hazardous waste management requirements provided in the proposed mercury waste classification and management regulations

(2) A requirement is imposed and enforced by another public agency that provides protection of human health and safety and the environment that is as effective as, and equivalent to, the protection provided by the requirement, or requirements, from which the activity is being exempted.

DTSC Evaluation: The finding above is not applicable to the exemption from certain hazardous waste management requirements provided in the proposed mercury waste classification and management regulations.

(3) Conditions or limitations imposed on the exemption will provide protection of

human health and safety and the environment equivalent to the requirement, or requirements, from which the activity is exempted.

DTSC Evaluation: The finding above is applicable to the proposed mercury waste classification and management regulations. By streamlining generation, accumulation, and transportation requirements for discarded mercury-containing products, but continuing to impose requirements for their proper disposal or recycling, the proposed regulations will provide protection of human health and the environment that is equivalent to the protection provided by current requirements. A detailed discussion of U.S. EPA's rationale for adopting the federal universal waste standards, which are different from the general hazardous waste control regulations, is found in the four federal register notices incorporated by reference into this document. Following is a summary of U.S. EPA's universal waste rationale that is directly applicable to the proposed addition mercury-containing wastes to the State's existing universal waste regulations.

A. General Philosophy of Universal Waste Management Standards

Universal wastes are different from other hazardous wastes in several key aspects that make the proposed regulatory system equally protective and far less expensive waste than the traditional hazardous waste approach:

Size: Universal wastes are generally small and may be easily hidden. U.S. EPA weighed the benefits of the standard hazardous waste control regulations against their costs. From the point of view of that the costs would likely increase the improper management of difficult to detect wastes, such as many discarded mercury-containing products (e.g., thermometers, switches), U.S. EPA determined that an alternative waste management and less expensive system would generate proper waste management and less environmental damage.

Hazard per unit: Although some universal wastes contain very hazardous substances, each individual unit contains only a small quantity. The most serious hazards result from the release of large quantities of the hazardous constituents during nonhazardous waste management and disposal at nonhazardous waste landfills. U.S. EPA determined that the major focus of the regulations should be to make them straightforward and inexpensive enough to divert disposal of large volumes of universal waste from inappropriate landfills. U.S. EPA found this approach to be an acceptable alternative management system rather than attempting to absolutely minimize the potential for the release of hazardous constituents from each individual unit of universal waste. In other words, risking occasional insignificantly small releases in handling through an inexpensive and a straightforward process was deemed to pose much less of a real world hazard than

inappropriate disposal of larger quantities that would result if an expensive process were required.

B. Rationale for the Exemption from the Manifest Requirement, Health and Safety Code section 25160

U.S. EPA determined that using a hazardous waste manifest acted as a disincentive for the proper management of universal wastes. The disincentive comes from the regulatory requirements that accompany the use of a manifest, such as the requirements to obtain an identification (ID) number, comply with the waste code standards, and comply with detailed record keeping and retention requirements. In California, there is also a fee attached to the use of the manifest.

The following requirements that accompany use of the manifest contradict the universal waste management standards proposed in the mercury waste classification and management regulations:

1. Use of the manifest requires obtaining an ID number. This is a requirement that is not applied to small quantity universal handlers of universal waste in the proposed rule.

2. Use of the manifest requires that a waste be transported by a registered hazardous waste transporter.. The proposed rule does not require universal waste handlers to use registered transporters. Using registered transporters would increase costs to universal waste handlers.

3. Use of the manifest requires that a waste be sent to a permitted facility. This would preclude handlers from sending universal wastes to an unpermitted intermediate accumulation point. These accumulation points are one of the greatest incentives for proper accumulation and disposition of universal wastes.

In conclusion, the U.S. EPA has determined, and DTSC concurs, that the ability to track universal waste shipments using manifests is offset by the incentives for proper management provided by requirements in the proposed universal waste regulations. The tracking requirements of the proposed universal waste regulations would still include waste shipment tracking (e.g., bills of lading) and record keeping requirements. Both large and small quantity handlers must keep records of each waste shipment sent and received. Tracking of universal waste shipments can be accomplished through review of handler and destination facility records.

C. Rationale for Exemption from the Registered Hazardous Waste Transporter Requirement, Health and Safety Code section 25163

State law requires use of a registered hazardous waste transporter for offsite shipments of hazardous waste. The major benefit of registration is a slightly higher level of liability insurance because the training and equipment required to obtain a hazardous materials endorsement on a drivers license are equivalent to those of the hazardous waste transporter registration program. Use of a registered hazardous waste transporter adds significant expense to transportation of universal wastes given the much smaller number of registered transporters compared with the number of common carriers licensed to transport hazardous materials under Department of Transportation (DOT) requirements. Most shipments of mercury-containing universal wastes will be subject to DOT requirements, consequently allowing transportation without using registered hazardous waste transporters will not have a significant effect.

D. Rationale for Exemption from the Permit Requirement for Offsite Accumulation Points, Health and Safety Code section 25201

The proposed rules allow offsite accumulation by small and large quantity universal waste handlers without a hazardous waste facilities permit. Thus, the public review and comment, California Environmental Quality Act (CEQA) process, and the regulations associated with hazardous waste permits do not apply to offsite accumulation and storage of these waste categories. (The full permit program continues to apply to universal waste destination facilities in California.) This exemption allows universal waste handlers to establish collection and management programs for universal wastes without obtaining hazardous waste facility permits. In addition to the requirements in proposed regulations, project review, public notice, and CEQA determination would be addressed for new facilities as a function of site-specific, local agency requirements.

DTSC concurs with the judgment of U.S. EPA in this matter. The ability to accumulate and store universal waste without a permit will encourage: (1) firms to take back spent universal wastes when selling new products which will, when spent, become universal wastes; (2) household collection facilities to accept universal wastes for proper disposition; and (3) third party firms conveniently collect universal wastes for shipment and ultimate disposition in a cost effective manner. These accumulation activities are an essential component in the system to move universal wastes from generator locations to the permitted disposal and recycling sites.

> *(4) Conditions or limitations imposed on the exemption accomplish the same regulatory purpose as the requirement, or requirements, from which the activity is*

being exempted but at less cost or greater administrative convenience and without increasing potential risks to human health or safety or to the environment.

DTSC Evaluation: The finding above is applicable to the proposed mercury waste classification and management regulations. The proposed regulations are based on the expansion of the State's existing universal waste regulations that are largely based on the federal Universal Waste Rule. A detailed discussion of the U.S. EPA's rationale for adopting the federal universal waste standards, which are different from the general hazardous waste control regulations, is found in the four federal register notices incorporated by reference in this document. Following is a summary of the rationale.

A. General Philosophy of Universal Waste Standards

The standards of the proposed mercury waste classification and management regulations clearly impose a smaller financial cost on generators and other handlers of discarded mercury-containing products than with the California's Hazardous Waste Control Law. The proposed standards not only allow less expensive management, they also propose alternatives to the record keeping, permitting, and other administrative requirements of the general hazardous waste control law, including the three statutory requirements that are waived in the proposed regulations. U.S. EPA determined and DTSC concurs, that the costs and administrative convenience of meeting these alternative management standards for universal waste would drive proper management of these universal wastes. DTSC is also waiving the non-RCRA requirement for use of a registered transporter. In other words, DTSC believes that the standards of the universal waste regulations will not only be equally protective during the generation, accumulation, and shipment of discarded mercury-containing products, but will also move a much larger fraction of these universal waste categories to proper ultimate disposition.

B. Rationale for Exemption from the Manifest Requirement, Health and Safety Code section 25160

By exempting universal waste handlers from the requirement to use a manifest during transportation, the mercury waste classification and management regulations also (as discussed above) remove the requirements on handlers to obtain ID numbers, use registered transporters, and move the waste only to permitted facilities (not to unpermitted intermediate accumulation points). By removing the use of a manifest, handlers are allowed a greater administrative convenience and will be much more likely to send discarded mercury-containing products to proper disposition. As discussed earlier, tracking shipments of universal waste shipments can be accomplished through review of handler and destination facility records.

C. Exemption from the Registered Hazardous Waste Transporter Requirement, Health and Safety Code section 25163

As discussed above, there is little significant direct environmental protection provided by the registered hazardous waste transporter requirement for handlers of mercury-containing universal wastes. The administrative convenience of using a greater number of common carriers licensed to transport hazardous materials will provide an incentive for proper disposition.

D. Exemption from the Permit Requirement for Offsite Accumulation Points, Health and Safety Code section 25201

As discussed above, the ability to accumulate and store universal waste without a hazardous waste permit will provide additional collection options, and therefore, a greater administrative convenience in that additional intermediate accumulation points will be available. Householders and small businesses will benefit from the convenience of additional collection options. The offsite accumulation points must meet universal waste management standards, which are commensurate to hazards of the universal waste stored. These factors will provide an incentive for proper disposition of mercury-containing universal wastes.

NECESSITY REQUIREMENT

> *Section 25150.6 (d) A regulation adopted pursuant to this section shall not be deemed to meet the standard of necessity, pursuant to Section 11349.1 of the Government Code, unless the department has complied with subdivisions (b) and (c).*

DTSC Evaluation: As indicated above, this document represents compliance with those provisions.

COMPLIANCE WITH THE FEDERAL ACT

> *Section 25150.6 (e) The department shall not exempt a hazardous waste management activity from a requirement of this chapter or the regulations adopted by the department if the requirement is also a requirement for that*

activity under the federal act.

DTSC Evaluation: The proposed State regulatory standards are virtually identical to the federal universal waste standards in almost all provisions. When the actual regulatory standards vary, for instance in the requirements for handlers who remove mercury switches from motor vehicles that are destined for crushing, the State standards are more stringent and protective than the federal standards. The major deviation from the federal standards is the scope of the regulated community. The household and small quantity exemptions proposed in the base State Universal Waste Rule are both equivalent to, but much narrower in scope, than the corresponding federal exemptions. These proposed standards will both initially and ultimately regulate a much larger universe of entities than the corresponding federal rules thereby giving the State a much higher degree of environmental protection than provided by the federal Universal Waste Rule. Thus, proposed regulations meet the standards of Health and Safety Code sections 25159 and 25159.5 for regulations to obtain and maintain RCRA authorization.

AUTHORITY TO ADOPT REGULATIONS FOR CERTAIN HAZARDOUS WASTES

Section 25150.6 (f)(1) On and after January 1, 2002, the department may, by regulation, exempt a hazardous waste management activity from one or more of the requirements of this chapter pursuant to this section only if the regulations govern the management of one or the hazardous wastes listed in subparagraphs (A) to (E), inclusive, of paragraph (2), the regulations identify the hazardous waste as a universal waste, and the regulations amend the standards for universal waste management set forth in Chapter 23 (commencing with Section 66273.1) of Division 4.5 of Title 22 of the California Code of Regulations.

(2) The regulations that the department may adopt pursuant to paragraph (1) shall govern only the following types of hazardous waste:

(A) Electronic hazardous waste, as the department may describe in the regulations adopted pursuant to this subdivision.

(B) Hazardous waste batteries.

(C) Hazardous wastes containing mercury.

(D) Hazardous waste lamps.

(E) Lead-painted wood debris that is a hazardous waste.

DTSC Evaluation: These proposed regulations are being adopted for the waste category described in subdivision (f)(2)(C), hazardous wastes containing mercury. DTSC began the development of the mercury waste classification and management regulations after January 1, 2002, which is in accordance with the provisions of this subdivision.

SUNSET OF AUTHORITY

Section 25150.6(g) The authority of the department to adopt regulations pursuant to this section shall remain in effect only until January 1, 2003, unless a later enacted statute, which is enacted before January 1, 2003, deletes or extends that date. This subdivision does not invalidate any regulation adopted pursuant to this section prior to the expiration of the department's authority.

DTSC Evaluation: These regulations are proposed for adoption before January 1, 2003, which is the statutory deadline for inclusion of these waste categories under the State's existing universal waste regulations.

CONCLUSION

Based on the above analysis, DTSC concludes that the proposed regulations meet the criteria of Health and Safety Code section 25150.6 for variance from existing statutory requirements and will provide protection of human health and the environment.